Revue suisse Zool.	Tome 94	Fasc. 1	p. 3-15	Genève, avril 1987

Notes on the genus *Stetholiodes* Fall with descriptions of four new species (Coleoptera, Leiodidae, Anisotomini)

by

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With 36 figures

ABSTRACT

On the basis of material recently collected in Nepal, Darjeeling and Japan, by the staff of the Geneva Museum, descriptions and collecting data of the following new species are presented: *Stetholiodes reticulata* n. sp. (Nepal), *S. nipponica* n. sp. (Japan), *S. loebli* n. sp. (Darjeeling), *S. besucheti* n. sp. (Nepal), *S.* sp. indet. 1 (Nepal), *S.* sp. indet. 2 (Nepal).

As a consequence of both the study of these new species and the first observation of females of this genus, a revised diagnosis of *Stetholiodes* Fall is given.

INTRODUCTION

The genus *Stetholiodes* has included so far two species:

1) *S. laticollis* Fall (1910), which was described on the basis of one male from Indiana;

2) *S. striatipennis* (Port.), which was described on the basis of one male from Kashmir, originally as *Agathodes striatipenne* Port. (1926) = *Agathidiodes striatipenne* (Port.) (1944, not Guénée 1854).

Recent studies of both these species have been presented by:

— WHEELER (1981), who redescribes *S. laticollis* and discusses the phyletic relationship between *Stetholiodes* and *Agathidium;*

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— Newton (1982), who elucidates the above-reported synonymy;
— Angelini & De Marzo (1983), who redescribe *S. striatipennis.*

Now, we wish to contribute to the systematic knowledge of this genus by describing six new species and present a renewed diagnosis of it. Deliberately we do not name two of the new species, as only females of them are available.

The material comes from Nepal, Darjeeling and Japan, and has been collected by Drs. C. Besuchet and I. Löbl, to whom we are very grateful.

The specimens are deposited in the Geneva Museum (GM) and in Angelini's collection (AC).

Diagnosis of *Stetholiodes*

In the key to genera of the tribe Anisotomini, given below, *Stetholiodes* is differentiated fundamentally by the combination of four characters:

1) 3-segmented antennal club;
2) clypeal margin rectilinear, continuous with the antero-lateral margins of head (clypeus neither protruberant nor excavate);
3) supraocular carina present;
4) both elytra with 9 sharp punctured striae.

Further common characters of the seven species are:
— coloration of dorsum uniform;
— clypeal line absent;
— elytra without microsculpture;
— elytra with a sharp humeral angle;
— sutural striae of elytra present;
— metathoracic wings present;
— lateral lines of mesosternum complete;
— metasternum without femoral lines;
— male tarsal formula 5-5-4.

Interspecific variability concerns:
— body length: 1.85-3.30 mm;
— presence/absence of microsculpture on head and pronotum;
— head shape: presence/absence of "tempora";
— coloration of antennae: either uniform or darker at club;
— number of Hamann's sensilla of each antenna: usually 3, but 2 in one species;
— dorsal outline of pronotum (angulate at sides in one species);
— presence/absence of secondary punctures on elytra;
— female tarsal formula: either 5-4-4 or 4-4-4.

Distribution: Pakistan, Kashmir, Nepal, Darjeeling, Japan, Indiana (USA).

Conclusions: From the study of the characters considered in the key to genera it is clear that *Stetholiodes* can be regarded as separate genus. Moreover, we can agree with the statement (Wheeler, 1981; Newton, 1982) that *Stetholiodes* is closely allied to *Agathidium,* as we find quite a high number of common characters (see the last column of table I) between these two genera.

Key to genera of Anisotomini

1 Antennal club 5-segmented. Clypeus protruberant; supraocular carina absent; head without tempora; elytra either with or without series of punctures; tarsal formula: ♂ 5-5-4, ♀ either 5-4-4 or 4-4-4 ..... *Anisotoma* Panzer, 1797

1′ Antennal club either 4- or 3-segmented 2

2 Antennal club 4-segmented 3

2′ Antennal club 3-segmented 4

3 Clypeus protruberant; clypeal line present. Supraocular carina absent; tempora absent; elytra either with or without punctured striae; tarsal formula: ♂ 5-5-4, ♀ 4-4-4 ..... *Amphycillis* Erichson, 1845

3′ Clypeus not protruberant; clypeal line absent. Supraocular carina absent; tempora absent; elytra without punctured striae; tarsal formula: ♂ 4-4-4, ♀ 4-4-4 ..... *Afroagathidium* Angelini & Peck, 1984

4 Clypeus protruberant 5

4′ Clypeus not protruberant 7

5 Supraocular carina absent. Tempora absent; elytra without punctured striae; tarsal formula: ♂ 5-5-4, ♀ 4-4-4 ..... *Liodopria* Reitter, 1909

5′ Supraocular carina present 6

6 Tempora absent; head abruptly narrowing behind eyes; clypeus sharply protruberant. Elytra either with or without punctured striae; tarsal formula: ♂ 5-5-4, ♀ either 5-4-4 or 4-4-4 ..... *Cyrtoplastus* Reitter, 1884

6′ Tempora present; clypeus slightly protruberant. Elytra without punctured striae; tarsal formula: ♂ not known, ♀ 4-4-4 .... *Sphaeroliodes* Portevin, 1905

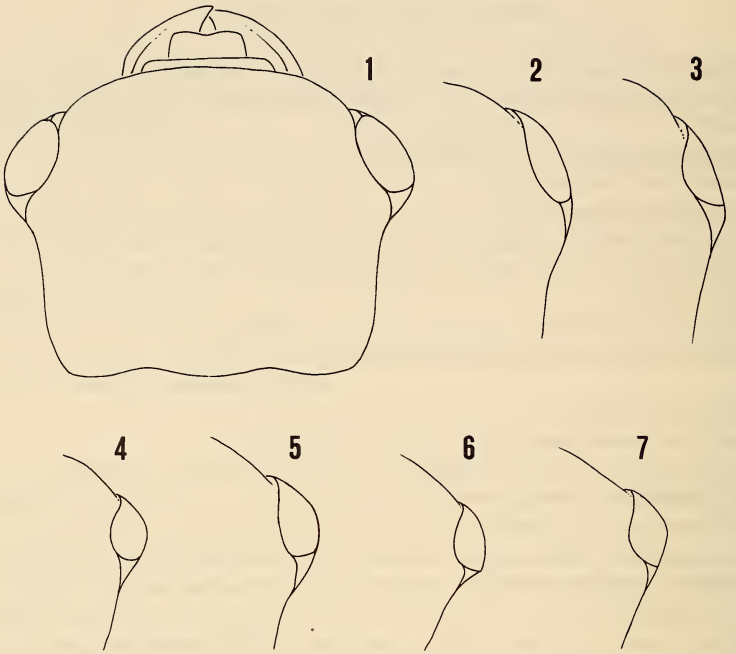
7 Clypeus not excavate; elytra with clearly defined punctured striae. Tempora either present or absent; tarsal formula: ♂ 5-5-4, ♀ either 5-4-4 or 4-4-4 .. .. *Stetholiodes* Fall, 1910

7′ Clypeus more or less deeply excavate; elytra without well defined punctured striae. Tempora either present or absent; tarsal formula: ♂ either 5-5-4 or 4-4-4, ♀ either 5-4-4 or 4-4-4 ..... *Agathidium* Panzer, 1797

Table 1.

Variation of six key characters in the tribe Anisotomini.
The last column gives the number of the characters common between each genus and *Stetholiodes*

	number of antennal club segments	clypeus	supraocular carina	punctured elytral striae	tempora	clypeal line	number of char. common with *Stethol.*
Anisotoma	5	protr.	abs.	pres., abs.	abs.	pres.	1
Amphycillis	4	protr.	abs.	pres., abs.	abs.	pres.	1
Afroagathidium	4	not protr.	abs.	abs.	abs.	abs.	2
Liodopria	3	protr.	abs.	abs.	abs.	pres.	1
Cyrtoplastus	3	protr.	pres.	pres., abs.	abs.	pres.	3
Sphaeroliodes	3	protr.	pres.	abs.	pres.	pres.	2
Stetholiodes	3	not protr.	pres.	pres.	pres., abs.	abs.	—
Agathidium	3	not protr.	pres.	abs.	pres., abs.	pres., abs.	4



FIGS 1-7.

Head (complete outline or detail) of: 1, *S. reticulata* sp. n.; 2, *S. striatipennis* (Port.); 3, *S. nipponica* sp. n.; 4, *S. loebli* sp. n.; 5, *S. besucheti* sp. n.; 6, *S.* sp. 1; 7, *S.* sp. 2.

KEY TO SPECIES OF *Stetholiodes*

1 Dorsum of head and pronotum striolate 2
1′ Dorsum of head and pronotum without microsculpture 4
2 Antennae with black club; head sharply narrowing behind eyes (fig. 1). Nepal ..... *reticulata* n. sp.
2′ Antennae uniformly testaceous or just a little darker at club; head not sharply narrowing behind eyes 3
3 Tempora short (1/7 as long as eyes: fig. 2). Kashmir ..... *striatipennis* (Port.)
3′ Tempora long (1/4 as long as eyes: fig. 3). Japan ..... *nipponica* n. sp.
4 Elytra without puncturation of interstriae. Darjeeling ..... *loebli* n. sp.
4′ Elytra with more or less densely punctured interstriae 5
5 Larger size (body length: 2,8 mm). Nepal ..... *besucheti* n. sp.
5′ Smaller size (body length: 2.05-2.25 mm) 6
6 Dorsal outline of pronotum uniformly curved at sides (fig. 21); head widest at the posterior margin of eyes (fig. 6); apical part of spermatheca twisted (fig. 35); tarsal formula ♀: 5-4-4. Nepal ..... sp. indet. 1
6 Dorsal outline of pronotum angulate at sides (fig. 22); head widest at middle length of eyes (fig. 7); apical part of spermatheca not twisted (fig. 36); tarsal formula ♀: 4-4-4. Nepal ..... sp. indet. 2

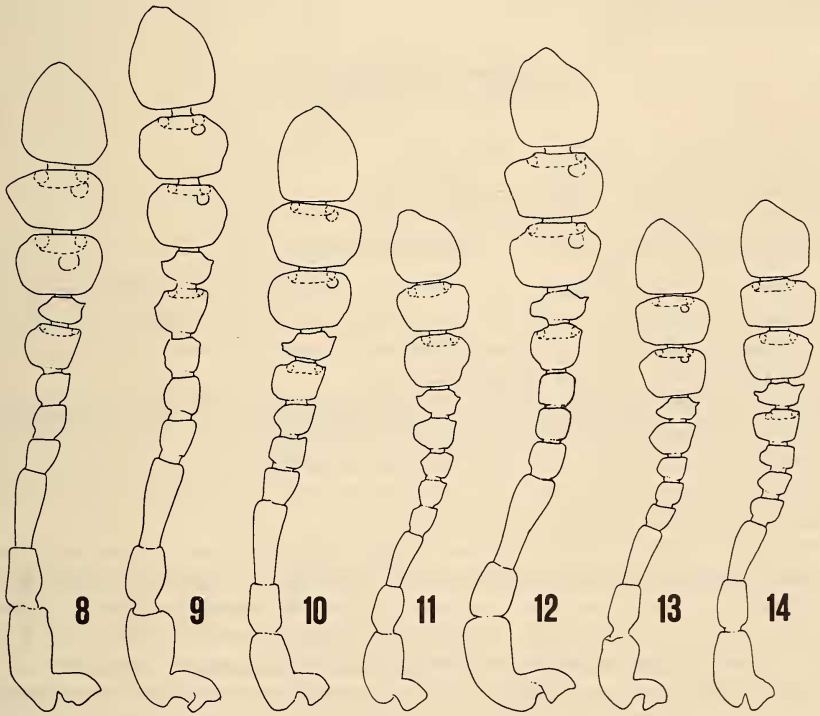
Stetholiodes reticulata sp. n.
Figs 1, 8, 15, 16, 23, 24, 33

Length 2.30-2.65 mm (holotype ♂ 2.55 mm). Dorsum of head and pronotum reddish-brown, elytra black; venter reddish-brown; antennae with dark club; legs reddish-brown. Microreticulate only on head and pronotum. Whole dorsum punctate; both elytra with nine punctured striae.

Head: Microreticulation uniform but superficial. Punctures small, moderately impressed, spaced from each other by 1-6 times their own diameter. 3rd antennal segment 1.3 times as long as the 2nd and longer than 4th+5th (fig. 8); Hamann's organ: gutter with one vesicle in both 9th and 10th antennal segments, gutter without vesicles in the 7th. Head dorsal outline: fig. 1.

Pronotum: Microreticulation and punctuation as on head. 1.6 times as broad as head, moderately transverse (W/L = 1.69) and moderately convex (W/H = 1.69). Anterior margin slightly bent (fig. 16). Lateral outline truncate (fig. 15). Holotype: length 0.73 mm, width 1.24 mm, height 0.73 mm.

Elytra: Microreticulation absent. Punctures of striae large and impressed, spaced from each other by 0.5-1 time their own diameter; punctures of interstriae very small, superficial



Figs 8-14.

Antenna of: 8, *S. reticulata* sp. n.; 9, *S. striatipennis* (Port.); 10, *S. nipponica* sp. n.; 11, *S. loebli* sp. n.; 12, *S. besucheti* sp. n.; 13, *S.* sp. 1; 14, *S.* sp. 2.

and sparse. As broad as pronotum, as broad as long and moderately convex (W/H = 1.69). Lateral outline with sharp humeral angle (fig. 15). Sutural striae sharp, extended within the apical half. Holotype: length 1,25 mm, width 1.24 mm, height 0.72 mm.

Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent.

Legs: Tarsal formula ♂ 5-5-4, ♀ 5-4-4.

Male copulatory organ (figs 23-24): Aedeagus slender, with proximal part simple, lateral margins sinuate, apex truncate; ventral piece bifid. Parameres slender, sinuate near apex.

Spermatheca (fig. 33): Basal part pear-shaped; apical part slender and short.

Discussion: *S. reticulata* sp. n. is very similar to *S. striatipennis* (Port.) in habitus and color and is closely related to the latter by the presence of microreticulation on head and pronotum. It differs in size, shape of eyes, ratio 3rd/2nd in antennal segments.

Collecting methods: Sifting fungi on dead oak-trees; sifting leaves and rotten wood at base of tree trunks in dry environment.

Types: NEPAL, Patan district, Bagmati province, Phulcoki, 2600-2700 m, 15.X.1983, leg. Löbl & Smetana, holotype ♂ N.5215 in GM; Sankhuwasawa distr., Kosi prov., south Mangsingma, 2200 m, 11.IV.1984, leg. Löbl & Smetana, 1♀ paratype N.5534 in GM, 1♂ paratype N.5536 in AC.

Distribution: Nepal.

Stetholiodes striatipennis (Port.)
Figs 2, 9, 17, 25, 26

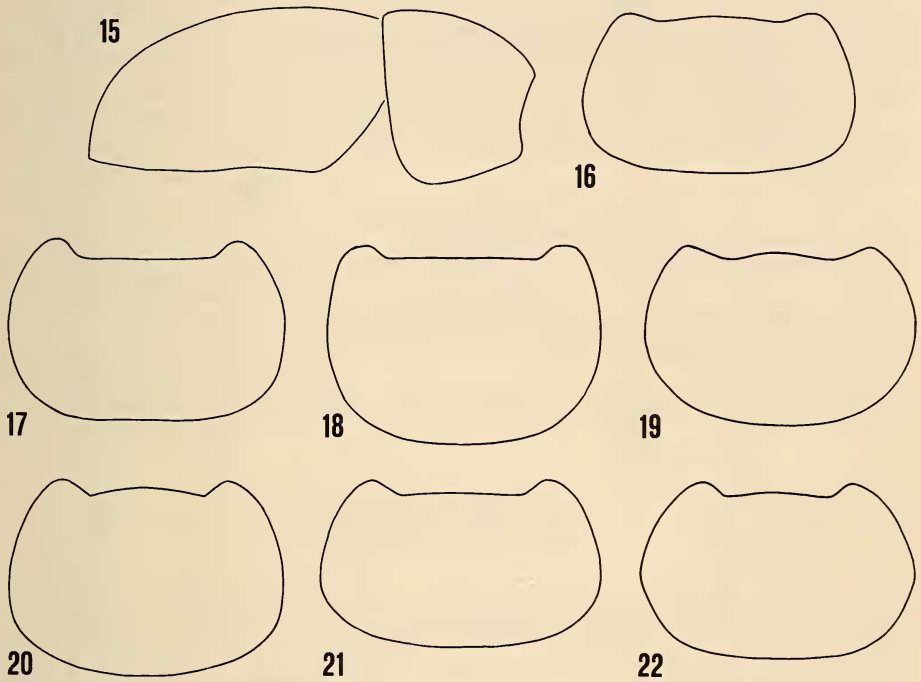
Agathodes striatipenne Portevin, 1926: 80-81.
Agathidiodes striatipenne: PORTEVIN 1944: 169.
Stetholiodes striatipennis: NEWTON 1982: 337-338.
Stetholiodes striatipennis: ANGELINI & DE MARZO 1983: 5-8.

Length 2.85-3.30 mm (holotype ♂ 3.30 mm). Dorsum of head reddish-brown, pronotum darker, elytra black with reddish-brown apex; venter reddish-brown; antennae with dark club; legs reddish-brown. Microreticulate only on head and pronotum. Whole dorsum punctate; both elytra with nine punctured striae.

Head: Microreticulation uniform but superficial. Punctures large and impressed, spaced from each other by 1-2 times their own diameter; some smaller punctures are interposed. 3rd antennal segment 1.5 times as long as the 2nd and as long as 4th+5th (fig. 9); Hamann's organ: gutter with one vesicle in both 9th and 10th antennal segments; gutter without vesicles in the 7th. Shape of eyes: fig. 2.

Pronotum: Microreticulation as that of head. Punctures rather smaller than those of head, spaced from each other by 1-4 times their own diameter; some very small punctures are interposed. 1.7 times as broad as head, moderately transverse (W/L = 1.74) and moderately convex (W/H = 1.66). Anterior margin nearly rectilinear (fig. 17). Lateral outline truncate. Holotype: length 0.86 mm, width 1.50 mm, height 0.90 mm.

Elytra: Microreticulation absent. Principal punctures (series) large and impressed, spaced from each other by 0.5-1 time their own diameter; secondary punctures small and superficial, spaced from each other by 3-4 times their own diameter. Just a little broader than pronotum, very much longer than broad (W/L = 0.86) and slightly convex (W/H = 1.92). Sutural striae sharp, extended within the apical half. Holotype: length 1.82 mm, width 1.58 mm, height 0.82 mm.



FIGS 15-22.

Lateral outline of pronotum and elytra of: 15, *S. reticulata* sp. n. Dorsal outline of pronotum of: 16, *S. reticulata* sp. n.; 17, *S. striatipennis* (Port.); 18, *S. nipponica* sp. n.; 19, *S. loebli* sp. n.; 20, *S. besucheti* sp. n.; 21, *S.* sp. 1; 22, *S.* sp. 2.

Metathoracic wings present. Meso- and metasternum: median carina absent, lateral lines complete, femoral lines absent.

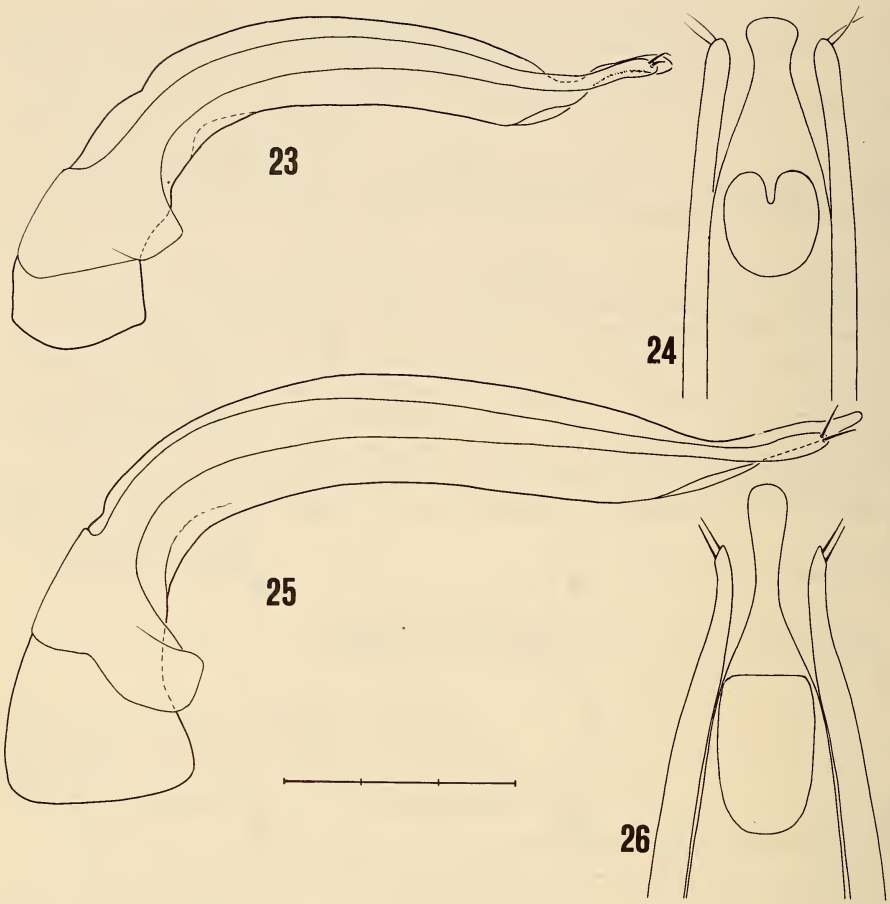
Legs: Tarsal formula ♂ 5-5-4, ♀ not known.

Male copulatory organ (figs 25-26): Aedeagus very slender, with proximal part simple, lateral margins convergent into a narrow spatula-like apex; ventral piece not bifid, slightly sclerotized. Parameres slender, bent up and enlarged at apex.

Discussion: See discussion of *S. reticulata* sp. n.

Material: KASHMIR, Aru, X.1977, 1♂ in Franz's collection, 1♂ in AC; holotype ♂ in Paris Museum.

Distribution: Kashmir.



FIGS 23-26.

Male copulatory organ (lateral view and ventral view of apex) of: 23-24, *S. reticulata* sp. n.; 25-26, *S. striatipennis* (Port.). Scale: 1 division = 0.1 mm.

Stetholiodes nipponica sp. n.
Figs 3, 10, 18, 27, 28

Length 2.50 mm (holotype ♂). Dorsum uniformly reddish-brown; venter reddish-brown, paler at mesosternum; antennae uniformly testaceous; legs reddish-brown. Striolate on head and pronotum, smooth at elytra. Whole dorsum punctate; both elytra with nine punctured striae.

Head: Microsculpture superficial but uniform. Punctures rather small but impressed, spaced from each other by 3-6 times their own diameter. 3rd antennal segment 1.7 times as long as the 2nd and longer than 4th+5th (fig. 10); Hamann's organ: gutter with one

vesicle in both 9th and 10th antennal segments, gutter without vesicles in the 7th. Shape of eyes: fig. 3.

Pronotum: Microsculpture less impressed than that of head. Punctuation similar to that of head. 1.6 times as broad as head, moderately transverse (W/L = 1.59) and very convex (W/H = 1.35). Anterior margin rectilinear (fig. 18). Holotype: length 0.72 mm, width 1.15 mm, height 0.85 mm.

Elytra: Punctures of striae large and impressed, spaced from each other by 0.5-1 time their own diameter; punctures of interstriae very variable in size. Broader than pronotum, as broad as long and moderately convex (W/H = 1.62). Sutural striae sharp, extended within the apical half. Holotype: length 1.25 mm, width 1.30 mm, height 0.80 mm.

Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent.

Legs: Tarsal formula ♂ 5-5-4, ♀ not known.

Male copulatory organ (figs 27-28): Aedeagus slender, with proximal part simple, lateral margins sinuate near apex, broadly rounded apex, ventral piece slightly sclerotized. Parameres slender, gently tapering, sinuate near apex.

Discussion: *S. nipponica* sp. n. exhibits presence of microsculpture of head and pronotum, as *S. reticulata* sp. n. and *S. striatipennis* (Port.); it differentiates itself by its head shape (presence of "tempora").

Types: JAPAN, Nara, Nara Park, 8.VIII.1980, leg. Löbl, holotype ♂ N.5216 in GM.

Distribution: Japan.

Stetholiodes loebli sp. n.
Figs 4, 11, 19, 29, 30, 34

Length 1.85-1.95 mm (holotype ♂ 1.90 mm). Dorsum uniformly reddish-brown; venter reddish-brown, paler at mesosternum; antennae uniformly testaceous; legs reddish-brown. Microreticulation absent. Head and pronotum with fine and sparse puncturation; both elytra with nine punctured striae.

Head: Punctures small and superficial, spaced from each other by 3-5 times their own diameter. 3rd antennal segment 1.2 times as long as the 2nd and as long as 4th+5th (fig. 11); Hamann's organ: gutter without vesicles in both 9th and 10th antennal segments; 7th segment without Hamann's sensillum. Shape of eyes: fig. 4.

Pronotum: Punctures as small and superficial as those of head, spaced from each other by 4-6 times their own diameter. 1.9 times as broad as head, moderately transverse (W/L = 1.72) and slightly convex (W/H = 1.9). Anterior margin slightly bent (fig. 19). Holotype: length 0.55 mm, width 0.95 mm, height 0.50 mm.

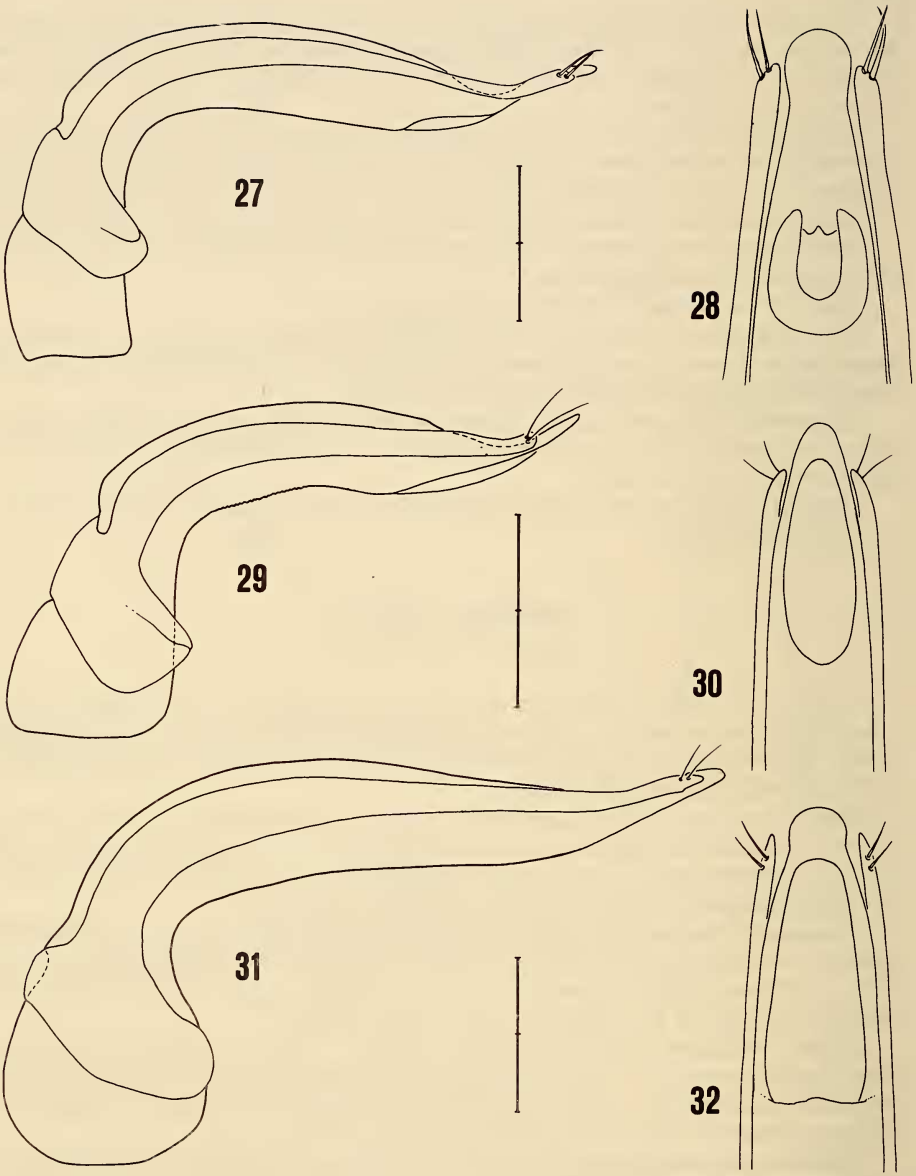
Elytra: Punctures of striae large and impressed within the basal 2/3 of elytra; interstriae not punctured. Just a little broader than pronotum, as broad as long and moderately convex (W/H = 1.63). Sutural striae sharp, extended within the apical half. Holotype: length 0.98 mm, width 0.98 mm, height 0.60 mm.

Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent.

Legs: Tarsal formula ♂ 5-5-4, ♀ 4-4-4.

Male copulatory organ (figs 29-30): Aedeagus comparatively stout, with proximal part simple, lateral margins gently convergent into a rounded apex, slightly sclerotized ventral piece. Parameres slender, just a little sinuate at apex.

Spermatheca (fig. 34): Basal part pear-shaped, apical part thin and short.



FIGS 27-32.

Male copulatory organ (lateral view and ventral view of apex) of: 27-28, *S. nipponica* sp. n.; 29-30, *S. loebli* sp. n.; 31-32, *S. besucheti* sp. n. Scale: 1 division = 0.1 mm.

Discussion: *S. loebli* sp. n. is lacking microsculpture on the whole dorsum, as *A. besucheti* sp. n.; it differs from the latter by absence of secondary punctures on elytra, dorsal outline of pronotum and size.

Derivatio nominis: Dedicated to Dr. Ivan Löbl (Geneva).

Types: India, Darjeeling district, Ghoom-Lopchu, 2000 m, 14.X.1978, leg. Besuchet & Löbl, holotype ♂ N.5519, 1♂ and 1♀ paratypes N.5520, 5521 in GM, 1♂ and 1♀ paratypes N.5522, 5523 in AC; Darjeeling district, Algarah, 1800 m, 9.X.1978, leg. Besuchet & Löbl, 1♀ paratype N.5524 in GM; Darjeeling district, Tigerhill, 2200-2300 m, 13.X.1978, leg. Besuchet & Löbl, 1♂ paratype N.5525 in AC.

Distribution: India (Darjeeling).

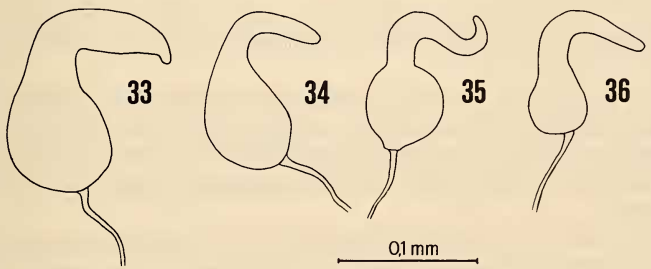
Stetholiodes besucheti sp. n.
Figs 5, 12, 20, 31, 32

Length 2.80 mm (holotype ♂). Dorsum uniformly reddish-brown; venter reddish-brown, darker at metasternum; antennae uniformly testaceous; legs reddish-brown. Microreticulation absent. Whole dorsum punctate; both elytra with nine punctured striae.

Head: Punctures large and impressed, spaced from each other by 0.5-1 time their own diameter. 3rd antennal segment 1.6 times as long as the 2nd and longer than 4th+5th (fig. 12); Hamann's organ: gutter with one vesicle in both 9th and 10th antennal segments, gutter without vesicle in the 7th. Shape of eyes: fig. 5.

Pronotum: Punctures smaller and more superficial than those of head, spaced from each other by 0.5-1 times their own diameter; some very small punctures are present. 1.7 times as broad as head, moderately transverse (W/L = 1.57) and moderately convex (W/H = 1.61). Anterior margin somewhat bent (fig. 20). Holotype: length 0.85 mm, width 1.34 mm, height 0.83 mm.

Elytra: Punctures of striae large and impressed; punctures of interstriae small and superficial, spaced from each other by 3-5 times their own diameter. Just a little broader than pronotum, as broad as long and moderately convex (W/H = 1.72). Sutural striae sharp, extended within the apical 2/5. Holotype: length 1.30 mm, width 1.38 mm, height 0.80 mm.



Figs 33-36.

Spermatheca of: 33, *S. reticulata* sp. n.; 34, *S. loebli* sp. n.; 35, *S.* sp. 1; 36, *S.* sp. 2.

Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent.

Legs: Tarsal formula ♂ 5-5-4, ♀ not known.

Male copulatory organ (figs 31-32): Aedeagus slender, with proximal part simple, lateral margins sinuate, broadly rounded apex, large and not sclerotized ventral piece. Parameres sinuate and gently tapering towards apex.

Discussion: See discussion of *S. loebli* sp. n.

Types: NEPAL, Sankhuwasawa district, Kosi province, forest at NE of Kuwapani, 2500 m, 28.III.1982, leg. A. & Z. Smetana, holotype ♂ N.5168 in GM.

Distribution: Nepal.

Stetholiodes ♀ *species indet. 1*
Figs 6, 13, 21, 35

Material: NEPAL, Kosi prov., Induwa Khola valley, 2000 m, 16.IV.1984, leg. Löbl & Smetana, 1 ♀.

Length 2.05 mm. Dorsum uniformly reddish-brown; antennae uniformly testaceous; legs reddish-brown. Head and pronotum without microsculpture, but distinctly punctate: punctures small but impressed, spaced from each other by 1-4 times their own diameter. Punctures of elytral striae large and impressed; punctures of interstriae very small and sparse.

Clypeal line absent. Lateral outline of head: fig. 6. 3rd antennal segment 1.4 times as long as the 2nd and longer than 4th+5th (fig. 13); Hamann's organ: gutter with one small vesicle in both 9th and 10th antennal segments, gutter without vesicles in the 7th.

Dorsal outline of pronotum: fig. 21. Elytra with sharp sutural striae, extended within the apical half. Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent. Tarsal formula ♀ : 5-4-4. Spermatheca: fig. 35.

Stetholiodes ♀ *species indet. 2*
Figs 7, 14, 22, 36

Material: NEPAL, Kosi prov., Chichila, south Ahale, 2200 m, 4.IV.1984, 1 ♀, leg. Löbl & Smetana; Bagmati prov., Dobate ridge, NE Barahbise, 2800 m, 2.V.1981, 1 ♀, leg. Löbl & Smetana.

Length 2.25-2.50 mm. Dorsum uniformly reddish-brown; antennae uniformly testaceous; legs reddish-brown. Head and pronotum without microsculpture but distinctly punctate: punctures small and impressed, spaced from each other by 1-5 times their own diameter. Punctures of elytral striae large and impressed; punctures of interstriae very small and sparse.

Clypeal line absent. Lateral outline of head: fig. 7. 3rd antennal segment 1.3 times as long as the 2nd and longer than 4th+5th (fig. 14); Hamann's organ: gutter without vesicles in the 9th, 10th and 7th segments.

Dorsal outline of pronotum: fig. 22. Elytra with sharp sutural striae, extended within the apical half. Metathoracic wings present. Meso- and metasternum: median carina weak, lateral lines complete, femoral lines absent. Tarsal formula ♀ : 4-4-4. Spermatheca: fig. 36.

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